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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,845	06/13/2005	Toshio Nakane	1226-110	2661
23117 7590 03/31/2008 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
LSTVOYB, GREGORY				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/538,845

Applicant(s)

NAKANE ET AL.

Examiner

GREGORY LISTVOYB

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17, 18, 21-24 and 26-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 18, 21-24 and 26-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-18, 21-24, 26 rejected under 35 U.S.C 103(a) as being unpatentable over Linstid, III et al (US Patent 6222000), herein Linstid in combination with Furuta et al (US Patent 5612101), herein Furuta ((necessitated by amendment).

Linstid discloses amorphous wholly aromatic polyester amide and multilayered article (see Claims 35 and 36) exhibiting optical anisotropy obtained by copolymerizing:

A 4-hydroxybenzoic acid-15-60%, preferably 20-40%

B 2-hydroxy-6-naphthoic acid 15-60%, preferably 20-40% (meeting limitation of Claim 17, since ratio A/B is always within the range of 0.15-4)

C 4-aminophenol 5-20%, preferably 10-15% (meeting limitation of Claim 17)

D isophthalic acid 7-15 %, preferably 10-15% (see Claim 16) (meeting limitation of Claim 17)

E terephthalic acid 5-20%, preferably 10-15% (Columns 3-4)

Art Unit: 1796

Linstid teaches that his liquid crystal copolymers can be used in a composition with Polyolefins, (such as Polyethylene or modified PE) which have melting point below 230C, meeting the limitation of Claim 17. (Typical T_m for HDPE is about 140C).

Glass transition temperatures, of the above copolymers are about 150C (Column 6, line 5), whereas melting point T_m is not observed (Column 5, line 65), which indicates that the above copolymers are amorphous. DSC measurements are made at 20 C/min temperature rising rate (Column 17, line 45).

Note that Linstid copolymer contains terephthalic acid, which is not claimed in Claim 1. However, this component is not prohibited in the Claim 17.

Linstid teaches that liquid crystalline polymers particularly desirable to use in such multilayered compositions as films, laminates, blow molded containers, etc.

Linstid teaches that the above liquid crystal copolymers may be used in combination with polyolefins and modified polyolefins, (Example 26, Column 24 and Column 3; line 10) for production of films, sheets, fibers, multi-layer laminates, blow- molded containers and other articles. (Column 16, line 20).

Regarding Claim 23, Linstid does not specify that a polyethylene he discloses for multilayered applications is HDPE. However, such articles as bottles, tanks and containers typically producing from HDPE. HDPE has a significant advantage over LDPE in terms of mechanical strength, which is critical for the above applications.

Linstid does not teach a ratio between the resins in the composition based on the above liquid crystal copolymers. Also, he fails to disclose that polyethylene in blow- molded article is high density polyethylene. In addition Linstid does not disclose that his liquid crystal composition can be processed into fuel tank. Hence the attention is directed towards Furuta. Linstid and Furuta are analogous art because they are from the same field of endeavor, utilizing liquid crystal polymers.

Furuta teaches a liquid crystal polyester resin composition film made of a liquid crystal polyester resin composition comprising (A) preferably 70 through 98% by weight of a liquid crystal polyester and (B) preferably 30 through 1% by weight of a thermoplastic resin (polyolefin, modified polyolefin, etc. (Column 10, line 10), by blown film extrusion or by laminating. The above liquid crystal polyester resin composition has an improved behavior in molten state which has been extraordinary in and drawback of the conventional liquid crystal polyesters and is easily molded into a film with excellent mechanical strength heat resistance and gas-barrier properties and gasoline-barrier properties (Abstract).

Furuta discloses that at above ratios liquid crystal polymer forms a continuous phase and other thermoplast forms a disperse phase. With increased content of thermoplast a moldability deteriorates and mechanical strength and barrier properties lowers. (Column10, line 15).

In order to obtain excellent mechanical properties, typical for liquid crystal copolymers it is important that liquid crystal polymer forms a continuous phase and other thermoplast forms a disperse phase. When the amount of dispersed phase exceeds 25-30%, two continuous phases formed. In this case values of most important mechanical properties, such as Young modulus, decrease. Therefore, it is important to keep a content of thermoplastic polymer in the composition below 30% wt.

Therefore, it would have been obvious to a person with ordinary skills in the art to combine liquid crystal and thermoplastic resin using Furuta's ratio between them in order to improve physical properties of a final molded article

Regarding Claim 23, Furuta discloses that polyethylene in his composition is high density polyethylene (HDPE) (Example 6, column 17).

Since HDPE has much better mechanical properties than LDPE due to its higher crystallinity it would have been obvious to a person with ordinary skills in the art to use HDPE for high end applications, such as large blow molded containers.

Regarding Claim 24, Furuta discloses that his composition can be processed into a fuel tank (Comparative Example 6, Column 18).

Since Linstid composition has an exceptional mechanical and barrier properties and ability to be processed by blow molding, it would have been obvious to a person with ordinary skills in the art to use a composition based on Linstid copolymers for manufacturing of fuel tanks.

Claims 27-32, 34-42 rejected under 35 U.S.C..103(a) as being unpatentable over Linstid in combination with Furuta and Charbonneau et al (US Patent 4351918), herein Charbonneau (necessitated by amendment).

Linstid discloses amorphous wholly aromatic polyester amide and multilayered article (see Claims 35 and 36) exhibiting optical anisotropy (see discussion above).

Listid teaches a multilayer article based on the above liquid crystalline polymer and polyethylene (see discussion above).

Furuta discloses specific ratios between liquid crystalline polymer and epoxy modified polyolefin, meeting the limitations of Claims 27 and 34.

The only difference between Linstid's polymer and one of Claims 27 and 34 is component (C) (or C'). Linstid teaches p-aminophenol, whereas the above Claims claim an aromatic diamine.

Charbonneau discloses liquid crystal copolymer comprising:

- (A) 40% 4-hydroxybenzoic acid,
- (B) 20% 2-hydroxy-6-naphtoic acid
- (C) 20% terephthalic acid (or isophthalic acid Column 6, line 15)
- (D) 5% p-phenylenediamine
- (E) 20% 2,6 dihydroxyanthraquinone.

Glass transition temperature, measured by DSC at temperature rising rate of 20C/min is 122C, whereas distinctive T_m transition is not observed (Column 17, Example 6).

Charbonneau teaches that terephthalic acid can be completely replaced by isophthalic acid (which have 1, 3 phenylene skeleton), which is a bending monomer.

Charbonneau group has additional amido-groups in its structure compare to Linstid's polymer, which has additional ester groups. Since Nitrogen of amido group has an electron pair, the donor-acceptor interaction with polyolefine, modified with acidic or epoxy groups.

Art Unit: 1796

Therefore, it would have been obvious to a person of ordinary skills in the art to modify Linstid's liquid crystal polymer with Charbonneau's phenylene diamine in order to achieve better compatibility with modified polyolefin in multilayered compositions.

Claims 33 and 43 rejected under 35 U.S.C. 103(a) as being unpatentable over Linstid and Furuta and further in view of Hiroshi (JP publication 03-284726) (necessitated by amendment).

Listid teaches a multilayer article based on the above liquid crystalline polymer and polyethylene (see discussion above).

Furuta discloses specific ratios between liquid crystalline polymer and modified polyolefine. (see discussion above).

Linstid and Furuta do not teach that liquid crystal resin contains 1,3 phenylenediamine. Hence attention is directed to Hiroshi.

Hiroshi discloses a composition based on liquid crystal oriented film comprising dicarboxylic acid and 15 or more weight percent of 1,3-phenylenediamine. This composition has the large tilt angle and good adhesive properties, when combined with a substrate.

Art Unit: 1796

Therefore, it would have been obvious to a person with ordinary skills in the art to use 1,3-phenylenediamine in Linstid's liquid crystal and thermoplastic resin composition in order to improve adhesiveness between layers in the composition.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 17-18, 21-24, 26 provisionally rejected on the ground of nonstatutory obviousness- type double patenting as being unpatentable over claims 11-23 of copending Application No. 10/525,642 in view of Furuta.

Art Unit: 1796

Application 10/525,642 claims the same polymer and the composition based on it as ones of the Application examined.

However, Application 10/525,642 does not claim specific ratio between liquid crystalline polymer and additional polyolefin.

Furuta teaches a liquid crystal polyester resin composition film made of a liquid crystal polyester resin composition comprising (A) preferably 70 through 98% by weight of a liquid crystal polyester and (B) preferably 30 through 1% by weight of a thermoplastic resin (polyolefin, modified polyolefin, etc. (Column 10, line 10).

Furuta discloses that at above ratios liquid crystal polymer forms a continuous phase and other thermoplast forms a disperse phase. With increased content of thermoplast a moldability deteriorates and mechanical strength and barrier properties lowers. (Column10, line 15).

Therefore, it would have been obvious to a person with ordinary skills in the art to combine liquid crystal and thermoplastic resin using Furuta's ratio between them in order to improve physical properties of a final molded article

Response to Arguments

Applicant's arguments filed on 1/11/2008 have been fully considered but they are not persuasive.

The Applicant argues that the disclosure of Linstid, II et al is quite broad and would not lead a skilled person to select the particular components as claimed herein by the present application to achieve the specific property of improved adhesiveness to another polymer resulting in a stable multilayer product. The Examiner disagrees.

Linstid explicitly teaches all the components listed in the corresponding Claims of the Application examined. The structure as claimed in Claim 17 does not preclude the use of other components in addition to ones listed in the Claim.

According to MPEP 2131.02 , a genus does not always anticipate a claim to a species within the genus. However, when the species is clearly named, the species claim is anticipated no matter how many other species are additionally named. *Ex parte A*, 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990).

The effect of particular structure fragments in Listid disclosure is well known. Therefore, an artisan can vary the elements of the structure in order to achieve particular results (Modulus, adhesiveness, etc.).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **GREGORY LISTVOYB** whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1796

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergent/
Primary Examiner, Art Unit 1796

GL
